Module 20
Range Diagrams

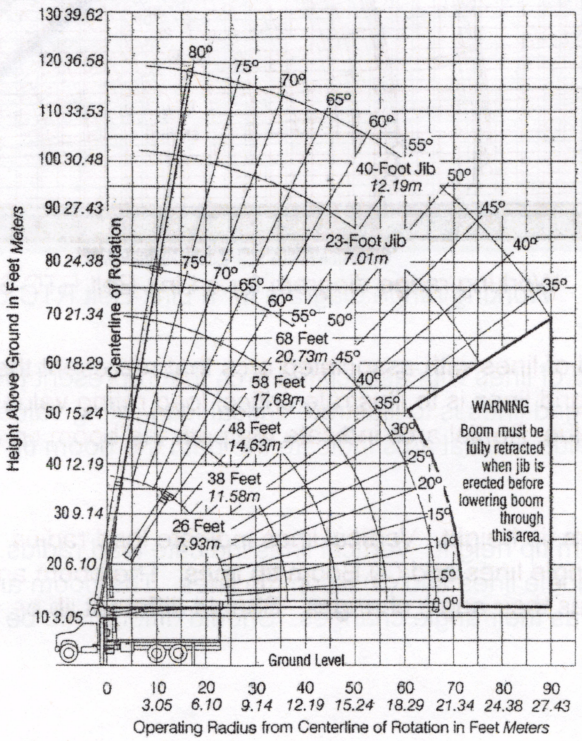
Learning Objectives

By the end of this section, you will:

1. Know the information found on a range diagram.
2. Know the uses of range diagrams.
3. Determine load radius from boom angle readings and a range diagram "grid".

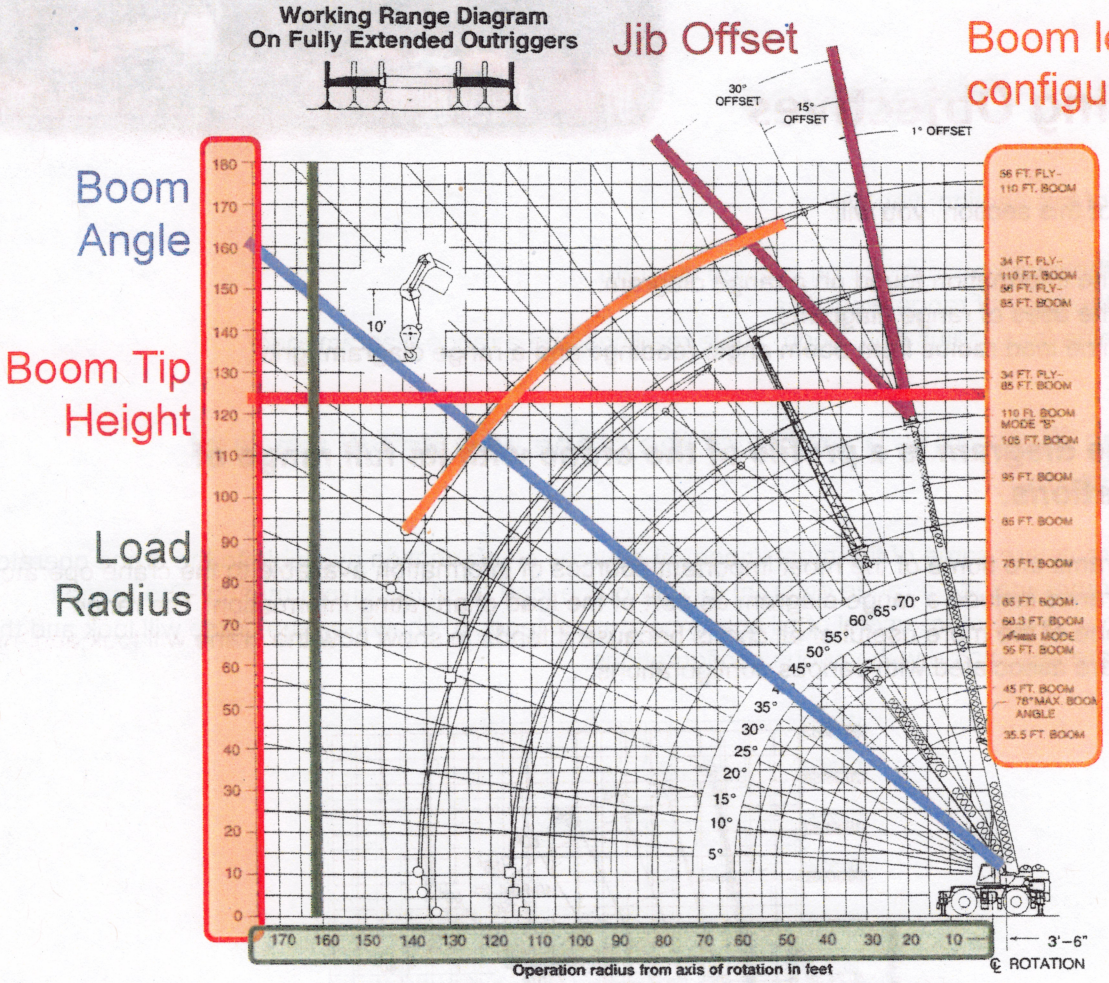
The range diagram is a profile of the crane with its full range of configurations.

Range diagrams are some of the most important sources of information available to the crane operator. All mobile cranes include a range diagram as part of the load chart rating information. The range diagram is one of the more useful of all charts because it tends to show how the crane will look and the values that are associated with various configurations.



The range diagram illustrates the following required information about a particular crane:

Placement	Boom length	Boom angle
Load radius	Jib and jib offset	Load heights



Working range diagram for a Link-Belt RTC-8050

Each range diagram is a grid of lines with associated arcs that represent the crane's full range of movement. The purpose of grid lines is to illustrate critical load rating values. Never operate a crane in an area where there is no value. Radial arcs indicate the path the boom tip will follow at specified boom lengths and jib offsets.

Horizontal lines indicate boom tip height. Vertical lines indicate load radius. There are two sets of radial (arc) lines: (1) Boom angle lines and (2) Boom tip lines. The boom and jib radial arc traces the position of the boom and jib as their angle changes. Should different jib be used, these configurations will be illustrated as well.

How are range diagrams helpful to the operator?

» Range diagrams are used to determine the configuration of the crane for a particular job. Geometry of job can be compared with diagram to determine boom length, boom angle, jib length, and jib offset. Maximum hook height determination. Verify minimum allowable clearances between boom tip and load blocks.

» Range diagram may be the only source for determining load radius from boom angle and boom length readings. Critical when actual radius can not be measured. Used for telescopic boom when boom is only partially extended and only load radius is known.

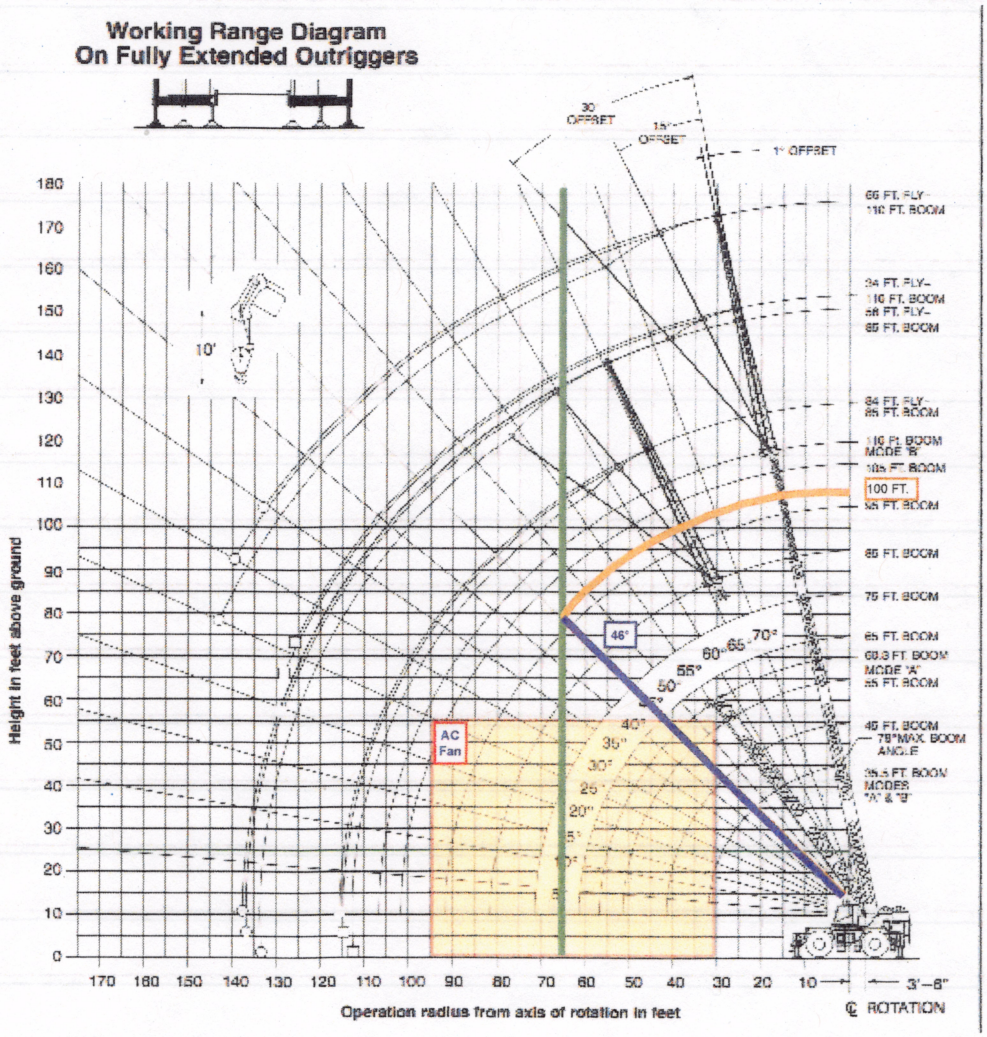
» Range diagram can be used to identify the minimum allowable clearances between the load blocks and boom tip.

» Since some load rating charts do not show boom/jib point elevations a range diagram will be available to the operator.

Example:

- The front of the crane is 17 feet from the building.
- The building is 45 feet tall and 65 feet long.
- The set point of the AC Fan is 35 feet inside of the edge.
- The load is 10' tall x 10' wide.
- The load weight is 600 lbs.

Determine: boom angle, boom length, boom configuration, radius to set point.



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